

WHAT IS CLAIMED:

1. A skin treatment method comprising applying an effective amount of electromagnetic radiation to a skin surface to at least partially prevent, reverse, or inhibit damage to the skin caused by exposure to a source of Xray or ultraviolet radiation, the applying of said electromagnetic radiation to said skin surface being effectuated on at least one occasion prior to, during or after the exposure of the individual to the source of Xray or ultraviolet radiation, the applying of said electromagnetic radiation to said skin surface being effectuated in the absence of any visible Xray or ultraviolet radiation damage to said skin surface.

2. The method defined in claim 1 wherein the applying of said electromagnetic radiation includes:

generating a predetermined number of pulses of electromagnetic radiation each having a predetermined electromagnetic spectrum; and

directing said pulses of electromagnetic radiation towards said skin surface, said pulses having a total energy predetermined to reduce Xray or ultraviolet radiation damage to the tissues of said skin surface.

3. The method defined in claim 2 wherein said number of pulses is greater than one, said pulses have an inter-pulse interval between approximately 1 msec and 500 msec, said total energy is between approximately 0.01 Joule and approximately 200 Joules of energy per square centimeter of said skin surface, and said pulse duration is between about 1 msec and 2 sec.

4. The method defined in claim 3 wherein said pulse duration is between about 1 msec and 100 msec.

5. The method defined in claim 3 wherein said total energy is between approximately 20 Joules and approximately 90 Joules of energy per square centimeter of said skin surface.

6. The method defined in claim 5 wherein said pulses are applied to said skin surface as a plurality of pulse packets, each of said packets having an inter-pulse interval between approximately 1 msec and 500 msec, said total energy being distributed over said pulse packets, said pulse duration being between about 1 msec and 2 sec for each of said packets, said packets being temporally spaced from each other by an inter-packet interval of between about 0.1 sec and twenty minutes.

7. The method defined in claim 2 wherein the number of pulses is two, the pulse duration is about 5.8 msec, the interpulse interval is approximately 20 msec, and the total energy applied is between about 20 Joules per square centimeter of said skin surface and about 90 Joules per square centimeter of said skin surface.

8. The method defined in claim 2 wherein the number of pulses is one, the pulse duration is between about 18 msec and 25 msec, and the total energy applied is between about 20 Joules per square centimeter of said skin surface and about 90 Joules per square centimeter of said skin surface.

9. The method defined in claim 2 wherein the electromagnetic radiation of said pulses is incoherent and wherein said spectrum includes wavelengths between about 400 nm and 1200 nm.

10. The method defined in claim 1 wherein the applying of said electromagnetic radiation to said skin surface is effectuated on multiple occasions each in conjunction with an exposure of the individual to Xray or ultraviolet radiation.

11. The method defined in claim 10 wherein each application of said electromagnetic radiation to said skin surface is effectuated within a predetermined interval of a respective exposure of the individual to Xray or ultraviolet radiation.

12. The method defined in claim 1 wherein the applying of said electromagnetic radiation to said skin surface is effectuated within a predetermined interval prior to the exposure of the individual to Xray or ultraviolet radiation.

13. The method defined in claim 12 wherein predetermined interval is less than about 24 hours.

14. The method defined in claim 1 wherein the applying of said electromagnetic radiation to said skin surface is effectuated within a predetermined interval after the exposure of the individual to Xray or ultraviolet radiation.

15. The method defined in claim 14 wherein said predetermined interval is less than approximately 24 hours.

16. The method defined in claim 1 wherein the electromagnetic radiation applied to said skin surface has a wavelength absorbable by an endogenous chromophore in tissues along said skin surface.

17. The method defined in claim 16 wherein the endogenous chromophore is melanin.

18. The method defined in claim 1 wherein the applying of said electromagnetic radiation to said skin surface is carried out on multiple occasions, at least one of said occasions being further removed in time than at least another of said occasions from the exposure of the individual to Xray or ultraviolet radiation.

19. The method defined in claim 18 wherein said occasions are regularly spaced in time from one another.

20. The method defined in claim 1, further comprising directing light at hair fibers protruding from said skin surface and, at least partially by virtue of such light application to the hair fibers, severing the hair fibers at said skin surface.

21. The method defined in claim 20 wherein the directing of light at the hair fibers includes reflecting light from a direction of propagation generally perpendicular to said skin surface to a direction of propagation substantially parallel to said skin surface.

22. The method defined in claim 1, further comprising applying a marker film to said skin surface to indicate that said electromagnetic radiation has been applied to said skin surface.

23. The method defined in claim 22 wherein said marker film includes a visually detectable pigment.

24. The method defined in claim 1 wherein the applying of said electromagnetic radiation to said skin surface is effectuated during the exposure of the individual to Xray or ultraviolet radiation.

25. The method defined in claim 1, further comprising providing an exogenous chromophore in tissues along said skin surface prior to the applying of said electromagnetic radiation to said skin surface.

26. The method defined in claim 1 wherein said exogenous chromophore is porphyrin.

27. The method defined in claim 1, further comprising transmitting ultrasound energy into biological tissues along said skin surface prior to, during or after the applying of said electromagnetic radiation to said skin surface.

28. The method defined in claim 1, further comprising applying a magnetic field to biological tissues along said skin surface prior to, during or after the applying of said electromagnetic radiation to said skin surface.

29. A prophylactic skin treatment method comprising:

generating a predetermined number of pulses of electromagnetic radiation each having a predetermined electromagnetic spectrum;

applying said pulses of electromagnetic radiation to an individual's skin surface with no visible Xray or ultraviolet radiation damage, said pulses having at least one predetermined pulse duration, and a predetermined total energy;

exposing the individual to Xray or ultraviolet radiation; and
at least in part owing to the applying of said pulses to said skin surface, reducing or preventing damage to the tissues of said skin surface arising from the exposing of said individual to Xray or ultraviolet radiation.

30. The method defined in claim 29 wherein the exposing of said individual to Xray or ultraviolet radiation occurs within a predetermined period of time of the applying of said pulses to said skin surface.

31. The method defined in claim 30 wherein said period of time is approximately 24 hours.

32. The method defined in claim 31 wherein the applying of said pulses to said skin surface is effectuated in multiple sessions spaced by intervals of greater than five minutes.

33. The method defined in claim 32 wherein the applying of said electromagnetic radiation includes, in each of said sessions:

generating a predetermined number of radiation pulses each having a predetermined electromagnetic spectrum; and

directing said radiation pulses towards said skin surface, said radiation pulses having at least one pulse duration and a total energy all predetermined to reduce Xray or ultraviolet radiation damage to the tissues of said skin surface.

34. The method defined in claim 33 wherein said number of said radiation pulses is greater than one, said radiation pulses having an inter-pulse interval between approximately 1 msec and 500 msec, said total energy is between approximately 0.01 Joule and approximately 200 Joules of energy per square centimeter of said skin surface, said pulse duration is between about 1 msec and 2 sec,

35. The method defined in claim 34 wherein said pulse duration is between about 1 msec and 100 msec, said total energy is between approximately 20 Joules and approximately 90 Joules of energy per square centimeter of said skin surface.

36. The method defined in claim 34 wherein the number of said radiation pulses is two, the pulse duration is about 5.8 msec, the interpulse interval is approximately 20 msec, and the total energy applied is between about 20 Joules per square centimeter of said skin surface and about 90 Joules per square centimeter of said skin surface.

37. The method defined in claim 34 wherein the number of said radiation pulses is one, the pulse duration is between about 18 msec and 25 msec, and the total energy applied is between about 20 Joules per square centimeter of said skin surface and about 90 Joules per square centimeter of said skin surface.

38. The method defined in claim 29, further comprising applying a marker film to said skin surface to indicate that said pulses of electromagnetic radiation have been applied to said skin surface.

39. The method defined in claim 38 wherein said marker film includes a visually detectable pigment.

40. The method defined in claim 29 wherein said predetermined number of pulses is one.

41. A device for treating an individual with light, comprising:

a hand-holdable casing;

a generator of electromagnetic radiation, said generator being mounted to said casing;

means on said casing for directing radiation from said generator towards the individual;

and

an ancillary energy generator mounted to said casing for producing another form of energy for application to the individual.

42. The device defined in claim 41 wherein said ancillary energy generator includes an electromechanical transducer and an ultrasonic-frequency electrical wave generator.

43. The device defined in claim 42 wherein said means for directing includes an applicator mounted to said casing for applying electromagnetic radiation from said generator to a skin surface of the individual, said applicator including a flexible member at least partially conformable to a topography of said skin surface, said transducer being in operative contact with

said flexible member for transmitting ultrasonic pressure waves to said skin surface through said flexible member.

44. The device defined in claim 43 wherein flexible member is a fluid-filled pouch.

45. The device defined in claim 41 wherein said ancillary energy generator includes an electromagnet.

46. A skin treatment method comprising applying an effective amount of mechanical pressure waves to a skin surface to at least partially prevent, reverse, or inhibit damage to the skin caused by exposure to Xray or ultraviolet radiation, the applying of said mechanical pressure waves to said skin surface being effectuated on at least one occasion prior to, during or after the exposure of the individual to Xray or ultraviolet radiation, the applying of said mechanical pressure waves to said skin surface being effectuated in the absence of any visible Xray or ultraviolet radiation damage to said skin surface.

47. The method defined in claim 46 wherein said mechanical pressure waves have an ultrasonic frequency.

48. The method defined in claim 46 wherein said mechanical pressure waves have a sonic frequency.

49. A skin treatment method comprising applying an effective amount of magnetic energy to a skin surface to at least partially prevent, reverse, or inhibit damage to the skin caused

by exposure to Xray or ultraviolet radiation, the applying of said magnetic energy to said skin surface being effectuated on at least one occasion prior to, during or after the exposure of the individual to Xray or ultraviolet radiation, the applying of said magnetic energy to said skin surface being effectuated in the absence of any visible Xray or ultraviolet radiation damage to said skin surface.

50. The method defined in claim 49 wherein said magnetic energy is applied in the form of an alternating magnetic field.

51. The method defined in claim 50 wherein said magnetic field has an oscillation frequency of greater than 10 kilohertz.

52. A hair treatment device comprising:
a hand-holdable casing;
a generator of electromagnetic radiation, said generator being mounted to said casing;
and
at least one optical element mounted to said casing so as to direct electromagnetic radiation produced by said generator in a direction substantially parallel to a skin surface, to impinge on hair fibers protruding from the skin surface.

53. The device defined in claim 52 wherein said optical element is a partially reflective and partially transmissive mirror.

54. A light treatment device comprising:

a hand-holdable casing;

an applicator interface attached to said casing, said interface including a liquid-filled chamber with a flexible skin-contacting surface or panel;

a generator of electromagnetic radiation, said generator being mounted to said casing;

and

at least one optical element mounted to said casing for directing light from said generator through the liquid in said chamber towards a skin surface in contact with said flexible skin-contacting surface or panel.

55. The device defined in claim 54 wherein said flexible skin-contacting surface or panel is transparent to the light from said generator.

56. The device defined in claim 54, further comprising means for applying a marker film to said skin surface to indicate that said electromagnetic radiation has been applied to said skin surface.

57. The method defined in claim 54, further comprising an ancillary energy generator mounted to said casing for producing another form of energy for application to the skin surface.

58. A light treatment method comprising:

generating light of a selected spectral composition;

directing said light towards a skin surface; and

applying a marker film to said skin surface to indicate that the light has been applied to said skin surface.

59. The method defined in claim 58 wherein said marker film includes a visible pigment composition.

60. The method defined in claim 58, further comprising operating a sensor to automatically detect the presence of said marker film on said skin surface.

61. A light treatment method comprising:
generating light of a selected spectral composition;
dividing said light into at least two bundles of light rays of substantially mutually exclusive wavelength ranges; and
directing at least one of said bundles of light rays towards a skin surface.

62. The method defined in claim 61 wherein said one of said bundles of light rays is directed into said skin surface, the other of said bundles of light rays being directed substantially parallel to said skin surface to impinge on hairs protruding from said skin surface.

63. The method defined in claim 61 wherein said one of said bundles includes wavelengths in a range below approximately 750nm, said other of said bundles including wavelengths in a range above approximately 750 nm.

64. The method defined in claim 61, further comprising the providing of goggles with lenses substantially opaque to light rays of a given one of said bundles and at least partially transparent to light rays of the other of said bundles.

65. A hair treatment method comprising:
generating light of a selected spectral composition;
applying a dye to hair along a skin surface; and
after the applying of said dye, directing the generated light towards the dyed hair in a
direction along and generally parallel to said skin surface.

65. The method defined in claim 65 wherein the dye is applied to a portion of a
protruding section of said hair.